Memo

To:	File	Project No **15210.000.0**	
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Date	December 14, 2009		

Subject **Chemetco - Next Steps for Processing of Metal Bearing Materials**

IAD is compiling information for the metal bearing material processing work plan. This Memo outlines the next steps as related to processing work at the site.

Purpose

Based on the large quantities of metal bearing materials present at the Chemetco site, a 1,000 ton per day processing rate has been initially identified as a reasonable goal to allow existing stockpiled materials to be processed in a timeframe not to exceed five years. The finer-grained scrubber sludge material would be processed first, as it requires less grinding than slag to reduce the grain size to a workable gradation.

A first step in working toward achieving the 1,000 ton per day objective is to set up a small pilot-scale demonstration plant to collect operational data that will allow the technology to be scaled up to a larger throughput plant. The Brick Shop provides a useful working space to establish the pilot plant.

IAD is presently relocating Michael Smallwood, the developer and owner of the proprietary processing technology, to the St Louis area so he can dedicate his full-time effort to the project. Within the next few weeks IAD will begin to establish the pilot demonstration plant within the Brick Shop. This pilot plant will consist of a series of small tanks, in addition to other existing tanks and related equipment left behind there by Metals Finance.

The pilot plant will have a capacity to slurry and batch process approximately 1 to 10 tons per day on an intermittent batch process basis. The capacity of the tanks would not be fully utilized in this initial pilot plant data gathering mode.

Operation of a small-scale demonstration plant will allow useful site-specific scrubber sludge processing information to be obtained that will enable the proprietary technology to be scaled up to a greater daily capacity in a reasonably short amount of time.

While these pilot plant activities are underway, a third party specialty testing company, Hazen Research, Inc. of Golden, Colorado, will be receiving small quantity samples (<1,000kg of each material) for a slag crushing and grinding treatability study. These samples will be shipped to Hazen under their treatability exclusion as a research laboratory.

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Pilot Plant Objectives

The on-site pilot demonstration plant will be useful in obtaining more specific operational data regarding the various steps involved in the overall process. Some of the data that will be obtained during operation of the pilot plant will include the following:

Slurry Water to Solids Mixing Ratio: Initial bench-scale studies suggest that a water to solids ratio of 3:1 will be required to liquefy and adequately convey the metal bearing material through the process. The solids to water ratio is a key component of determining the most effective solubility rate during treatment.

Optimal Residence Time during Hydrochemical Reactions: The recovery of metal bearing materials is a multi-step process, with each step requiring a certain amount of residence time for the proprietary reactions to occur. Initial bench-scale studies suggest that each step within the process will require approximately 20 to 50 minutes. Residence time is one function of gravity settling rates and is a necessary design component for sizing equipment and determining ultimate material throughput.

Material Composition and Percent Weight After Processing: Initial bench-scale studies indicate that approximately 85 percent of the original mass of metal bearing material (slag or scrubber sludge) is recovered as discrete elemental metals (Cu, Pb, Zn, Al, Ni, and Fe) or compound oxides, leaving approximately 15 percent as a residual by-product.

Composition of Post-Processing Residual Byproduct: Initial bench-scale studies suggest that residual materials contain primarily ferrous silicates and calcium silicates. The pilot scale effort will be designed to confirm the content of these materials for proper management after scale up.

Schedule

IAD envisions that within the next six weeks (by mid to late January) key personnel will have relocated to St Louis and the pilot demonstration plant will be assembled within the Brick Shop and ready to operate.

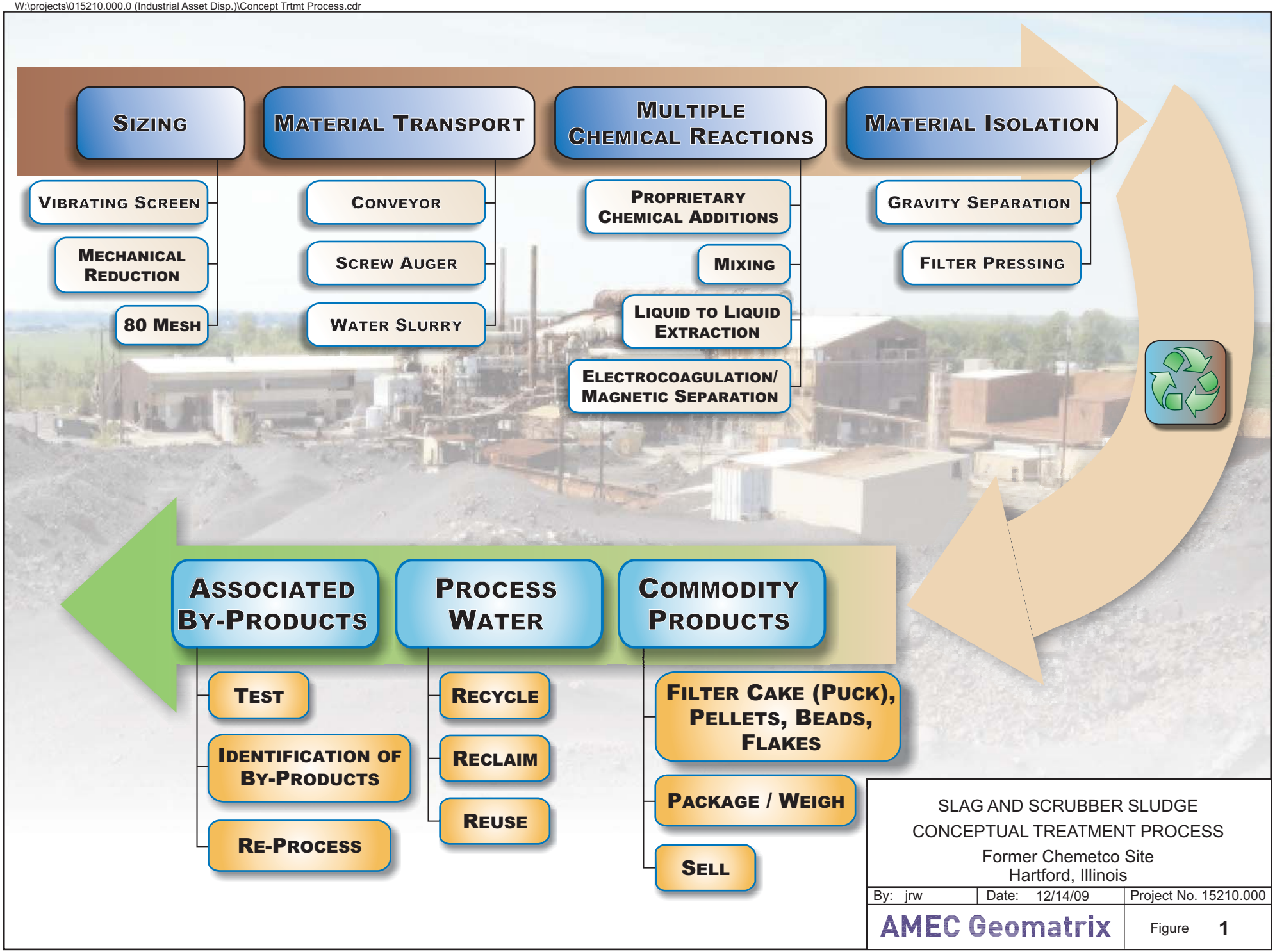
Once the pilot demolition plant has operated for several weeks and scale-up information is in hand, efforts will be made to procure larger equipment consistent with a 50 ton per day processing plant. As facility demolition progresses through the Spring of 2010, the larger plant will be established within the Tank House once the building is gutted and cleaned. The larger plant and the testing to be performed with the pilot plant will be discussed in the Processing Work Plan to be submitted to the agency.

A Conceptual Treatment Process Figure and a Process Flow Diagram are included with this memo.

Attachments:

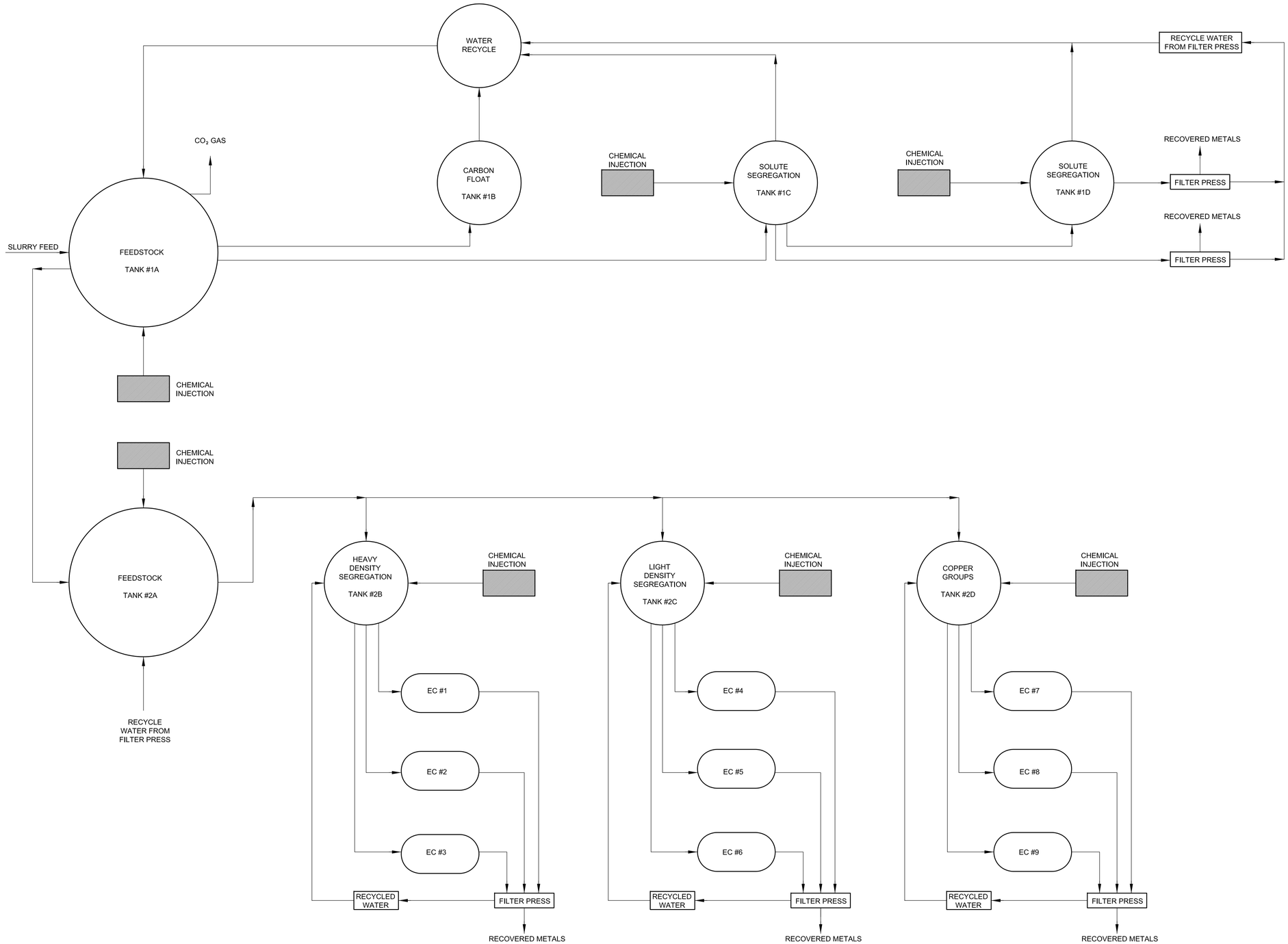
Figure 1 – Slag and Scrubber Sludge Conceptual Treatment Process
Draft Process Flow Diagram

W:\projects\015210.000.0 (Industrial Asset Disp.)\Concept Trtmt Process.cdr



SLAG AND SCRUBBER SLUDGE
CONCEPTUAL TREATMENT PROCESS
Former Chemetco Site
Hartford, Illinois

By: jrw	Date: 12/14/09	Project No. 15210.000
AMEC Geomatrix		Figure 1



CAUTION: THIS PLAN MAY BE REDUCED 0 1" 2" ORIGINAL SCALE

DRAFT

Filepath: Y:\15210.000.0\eng\old_layout.dwg
Plot Time: Dec 14, 2009 - 10:50am, Plotted By: pat.herring

REFERENCES:
PLANS
DATUM

NO.	REVISION	DATE	APRVD

DRAWN
DESIGNED
CHECKED
REVIEWED

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SLAG AND SCRUBBER SLUDGE METALS RECYCLING
FORMER CHEMETCO SITE
HARTFORD, ILLINOIS

PROCESS FLOW DIAGRAM

DATE: 12/14/09
SCALE: NTS
SHEET: 1 OF 1 SHEETS
PROJ No: 15210.000.0
X